

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: January 6, 1997

Date Received: December 17, 1996

Project: Absorbent/D007 Sludge, PO #M55556

Date Samples Extracted: December 18, 1996

Date Extracts Analyzed: December 20 and 30, 1996

**RESULTS FROM THE ANALYSIS OF THE SLUDGE SAMPLE  
FOR TCLP METALS IN ACCORDANCE WITH 40 CFR PART 261**

**Samples Processed Using Method 1311/3005A**

**Results Reported as mg/L (ppm)**

<u>Sample ID</u>	<u>M55556</u>	<u>Method Blank</u>	<u>TCLP Limits</u>
Analyte:			
Arsenic	<0.5	<0.5	5.0
Barium	<1	<1	100
Cadmium	<0.1	<0.1	1.0
Chromium	1.7	<0.5	5.0
Lead	<0.5	<0.5	5.0
Selenium	<0.5	<0.5	1.0
Silver	<0.5	<0.5	5.0
Mercury	<0.02	<0.02	0.2

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**QUALITY ASSURANCE RESULTS FOR TCLP METALS BY  
INDUCTIVELY COUPLED PLASMA (ICP)**

**Samples Processed by Method 1311**

**Samples Analyzed by Method 6010**

Laboratory Code: 74617 (Duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/L (ppm)	<0.5	<0.5	nm	0-20
Barium	mg/L (ppm)	<1	<1	nm	0-20
Cadmium	mg/L (ppm)	<0.1	<0.5	nm	0-20
Chromium	mg/L (ppm)	1.7	2.4	34a	0-20
Lead	mg/L (ppm)	<0.5	<0.5	nm	0-20
Selenium	mg/L (ppm)	<0.5	<0.5	nm	0-20
Silver	mg/L (ppm)	<0.5	<0.5	nm	0-20

Laboratory Code: 74617 (Matrix Spike)

Analyte:	Reporting Units	Spike Level	Sample Result	% Recovery MS MSD		Acceptance Criteria	Relative Percent Difference
Arsenic	mg/L (ppm)	10	<0.5	98	98	50-150	0
Barium	mg/L (ppm)	5	<1	108	107	50-150	1
Cadmium	mg/L (ppm)	5	<0.1	98	98	50-150	0
Chromium	mg/L (ppm)	5	1.7	100	98	50-150	2
Lead	mg/L (ppm)	10	<0.5	98	99	50-150	1
Selenium	mg/L (ppm)	10	<0.5	104	104	50-150	0
Silver	mg/L (ppm)	2	<0.5	99	96	50-150	3

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS MSD		Acceptance Criteria	Relative Percent Difference
Arsenic	mg/L (ppm)	10	98	98	80-120	0
Barium	mg/L (ppm)	5	110	103	80-120	7
Cadmium	mg/L (ppm)	5	99	96	80-120	3
Chromium	mg/L (ppm)	5	100	96	80-120	4
Lead	mg/L (ppm)	10	99	98	80-120	1
Selenium	mg/L (ppm)	10	104	101	80-120	3
Silver	mg/L (ppm)	2	96	98	80-120	2

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

a - The analyte was detected at a level less than five times the detection limit. The RPD results may not provide reliable information on the variability of the analysis.

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ENVIRONMENTAL CHEMISTS

Date of Report: January 6, 1997

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Project: Absorbent/D007 Sludge, PO #M55556

**QUALITY ASSURANCE RESULTS  
FOR MERCURY BY COLD VAPOR AA  
(METHOD 7470A)**

Laboratory Code: 74617 (Duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>	<u>Acceptance Criteria</u>
Mercury	mg/L (ppm)	<0.02	<0.02	nm	0-20

Laboratory Code: 74617 (Matrix Spike)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>% Recovery MS</u>	<u>% Recovery MSD</u>	<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
Mercury	mg/L (ppm)	0.03	<0.02	101	103	80-120	2

Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery MS</u>	<u>% Recovery MSD</u>	<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
Mercury	mg/L (ppm)	0.03	100	107	80-120	7

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.





**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

James E. Bruya, Ph.D.  
Beth M. Albertson, M.S.  
Bradley T. Benson  
Kelley D. Wilt

3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044

January 6, 1997

**INVOICE # 97ACU0106-2  
DUPLICATE COPY**

Accounts Payable  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

RE: Project Absorbent/D007 Sludge, PO #M55556: Results of testing requested  
by Gerry Thompson, Project Manager for material submitted on December  
17, 1996.

1 sludge sample analyzed for  
TCLP Metals @ \$180 per sample

\$ 180.00

Amount Due .....

\$ 180.00

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FAX: (206) 283-5044

January 6, 1997

Gerry Thompson, Project Manager  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on December 17, 1996 from your Absorbent/D007 Sludge, PO #M55556 project.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Kurt Johnson  
Chemist

keh  
Enclosures  
ACU0106R.DOC



5

Freidans

60%

APR 1964

## Standards

2

Relief Pitchers

407

Young

2B

310

## Bonds

Anderson

Step-back 301

SAITTA 302

10

42

50

38

140

5.3

4.0

12

1/

61

## Offense (Hitters)

Average

Hits

RUBS

RBT's

14 R's

SB

## Defense (Pitchers)

WINS

Wines autres Losses

ERA

Strike out  
mines  
works

Saves